SPURIOUS RADIATED EMISSIONS

element

PSA-ESCI 2019.05.10

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Band 71 LTE5/QPSK carriers transmitting (Low Ch 619.5MHz, Mid Ch 634.5MHz, High Ch 649.5MHz), Band 13 carriers disabled

Band 71 carriers disabled, Band 13 LTE10/QPSK carriers transmitting (Mid Ch 751.0MHz)

Band 71 LTE5/QPSK carriers transmitting (Low Ch 619.5MHz, Mid Ch 634.5MHz, High Ch 649.5MHz) , Band 13 LTE10/QPSK carriers transmitting (Mid Ch 751.0MHz)

POWER SETTINGS INVESTIGATED

48VDC

CONFIGURATIONS INVESTIGATED

NOKI0003 - 4

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	8000 MHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Antenna - Double Ridge	ETS Lindgren	3115	AJN	11-Oct-2018	24 mo
Generator - Signal	Keysight	N5182B-506	TEV	23-Apr-2018	36 mo
Power Sensor	Gigatronics	80701A	SRC	17-Sep-2019	12 mo
Meter - Power	Gigatronics	8652A	SOZ	17-Sep-2019	12 mo
Antenna - Dipole	ETS Lindgren	3121D - DB4	ADVD	13-Feb-2017	36 mo
Filter - Low Pass	Micro-Tronics	LPM50004	HHV	1-Aug-2019	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAJ	17-Mar-2019	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AJL	11-Oct-2018	24 mo
Cable	Northwest EMC	1-8.2 GHz	TXC	14-May-2019	12 mo
Amplifier - Pre-Amplifier	Fairview Microwave	FMAM63001	PAS	24-Jan-2019	12 mo
Antenna - Biconilog	ETS Lindgren	3143B	AYF	10-May-2018	24 mo
Cable	Northwest EMC	RE 9kHz - 1GHz	TXB	1-Aug-2019	12 mo
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	5-May-2019	12 mo

TEST DESCRIPTION

The EUT was tested with the antenna ports terminated with 50 ohm loads. The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These “pre-scans” are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.26). A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

AV = RMS Detector

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

When applicable, the EUT was then replaced with a ½ wave dipole that was successively tuned to each of the highest spurious emissions. A signal generator was connected to the dipole, and its output was adjusted to match the level previously noted for each frequency. The output of the signal generator was recorded, and by factoring in the cable loss to the dipole antenna and its gain (dBi); the effective isotropic radiated power for each radiated spurious emission was determined.

Where the radio test software does not provide for a duty cycle at continuous transmit conditions (> 98%) and the RMS (power average) measurements were made across the on and off times of the EUT transmissions, a duty cycle correction is added to the measurements using the formula of 10*LOG(dc).

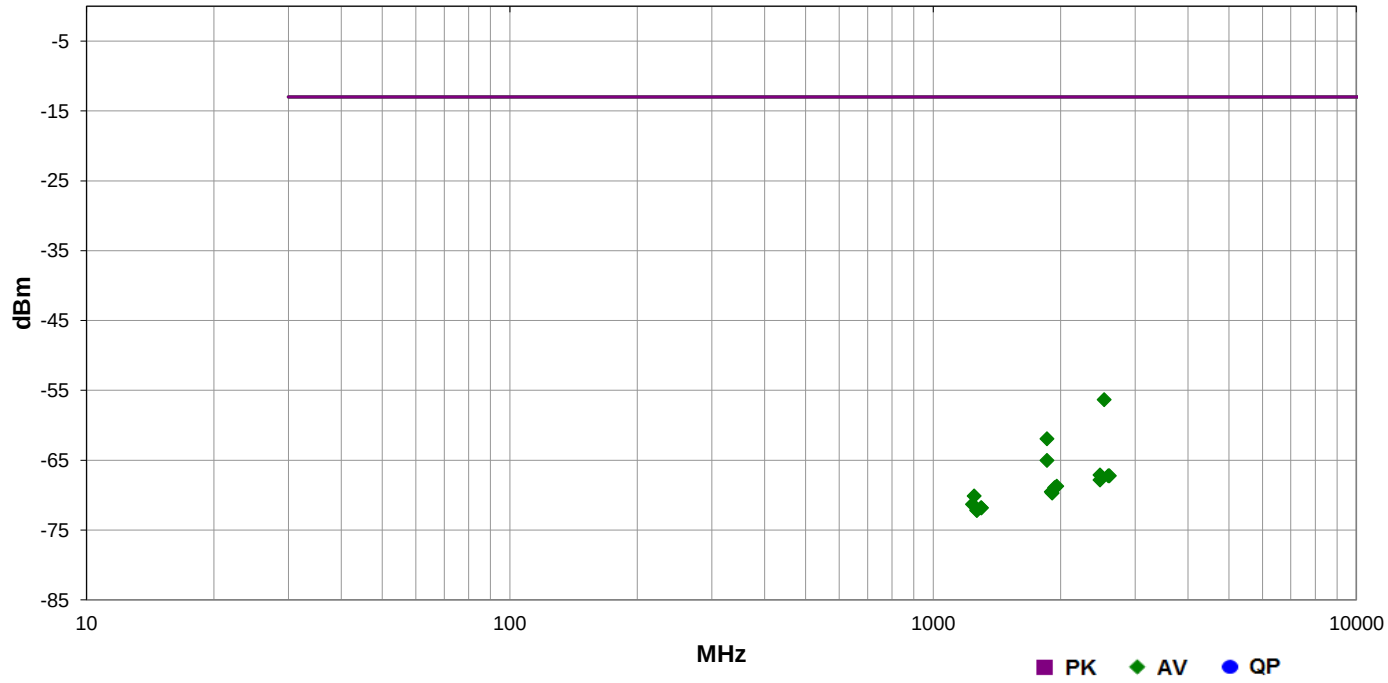
SPURIOUS RADIATED EMISSIONS

EmiR5 2019.08.15.1 PSA-ESCI 2019.05.10

Work Order:	NOKI0003	**Date:**	24-Oct-2019		
Project:	None	**Temperature:**	21.6 °C		
Job Site:	TX02	**Humidity:**	47.8% RH		
Serial Number:	BL1934X1001	**Barometric Pres.:**	1019 mbar	**Tested by:**	Jonathan Kiefer
EUT:	AHBOA Remote Radio Head (RRH)				
Configuration:	4				
Customer:	Nokia Solutions and Networks				
Attendees:	John Rattanavong, Mitchell Hill				
EUT Power:	48VDC				
Operating Mode:	Band 71 carriers transmitting (Low Ch 619.5MHz, Mid Ch 634.5MHz, High Ch 649.5MHz), Band 13 carriers disabled				
Deviations:	None				
Comments:	See table comments for EUT orientation, modulation, bandwidth and frequency information.				

Test Specifications	**Test Method**
FCC 27.53:2019	ANSI C63.26:2015

Run #	5	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	2537.625	3.3	0.0	Vert	AV	2.3E-9	-56.3	-13.0	-43.3	EUT Vertical, LTE, QPSK, 5 MHz BW, Mid Ch
	1858.000	1.3	248.0	Horz	AV	641.4E-12	-61.9	-13.0	-48.9	EUT Vertical, LTE, QPSK, 5 MHz BW, Low Ch
	1857.875	1.5	235.0	Vert	AV	314.1E-12	-65.0	-13.0	-52.0	EUT Vertical, LTE, QPSK, 5 MHz BW, Low Ch
	2479.125	1.5	266.0	Horz	AV	193.7E-12	-67.1	-13.0	-54.1	EUT Vertical, LTE, QPSK, 5 MHz BW, Low Ch
	2595.750	2.4	111.9	Horz	AV	189.3E-12	-67.2	-13.0	-54.2	EUT Vertical, LTE, QPSK, 5 MHz BW, High Ch
	2609.333	1.5	234.0	Vert	AV	189.3E-12	-67.2	-13.0	-54.2	EUT Vertical, LTE, QPSK, 5 MHz BW, High Ch
	2480.292	1.5	75.0	Vert	AV	164.9E-12	-67.8	-13.0	-54.8	EUT Vertical, LTE, QPSK, 5 MHz BW, Low Ch
	1960.000	1.5	87.0	Horz	AV	134.0E-12	-68.7	-13.0	-55.7	EUT Vertical, LTE, QPSK, 5 MHz BW, High Ch
	1937.333	1.5	63.9	Vert	AV	128.0E-12	-68.9	-13.0	-55.9	EUT Vertical, LTE, QPSK, 5 MHz BW, High Ch
	1903.417	1.5	274.9	Horz	AV	111.5E-12	-69.5	-13.0	-56.5	EUT Vertical, LTE, QPSK, 5 MHz BW, Mid Ch
	1911.042	1.5	69.0	Vert	AV	106.4E-12	-69.7	-13.0	-56.7	EUT Vertical, LTE, QPSK, 5 MHz BW, Mid Ch

	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	1250.083	1.5	188.0	Vert	AV	97.1E-12	-70.1	-13.0	-57.1	EUT Vertical, LTE, QPSK, 5 MHz BW, Low Ch
	1239.125	1.4	109.0	Horz	AV	73.6E-12	-71.3	-13.0	-58.3	EUT Vertical, LTE, QPSK, 5 MHz BW, Low Ch
	1299.000	3.9	136.9	Horz	AV	65.6E-12	-71.8	-13.0	-58.8	EUT Vertical, LTE, QPSK, 5 MHz BW, High Ch
	1301.792	1.5	9.0	Vert	AV	65.6E-12	-71.8	-13.0	-58.8	EUT Vertical, LTE, QPSK, 5 MHz BW, High Ch
	1269.042	1.5	79.0	Horz	AV	61.3E-12	-72.1	-13.0	-59.1	EUT Vertical, LTE, QPSK, 5 MHz BW, Mid Ch
	1269.667	1.5	142.9	Vert	AV	59.9E-12	-72.2	-13.0	-59.2	EUT Vertical, LTE, QPSK, 5 MHz BW, Mid Ch

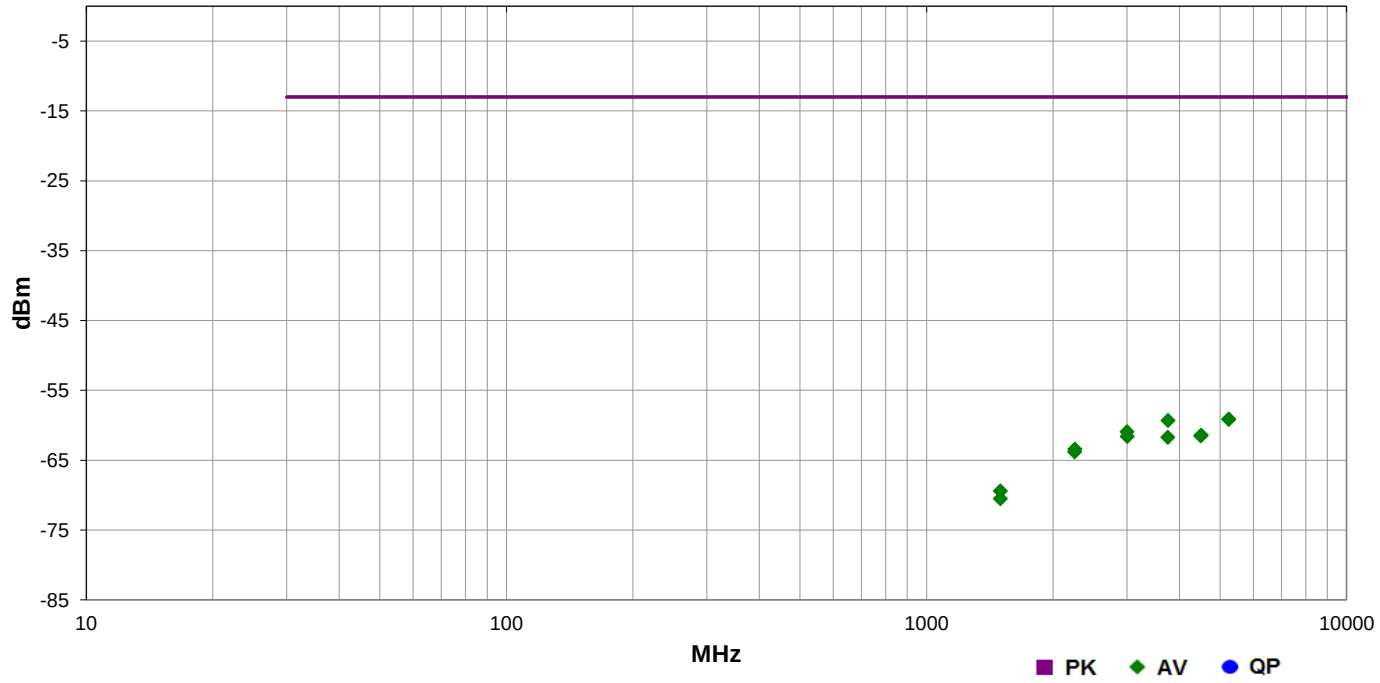
SPURIOUS RADIATED EMISSIONS

EmiR5 2019.08.15.1 PSA-ESCI 2019.05.10

Work Order:	NOKI0003	**Date:**	24-Oct-2019	Jonathan Kiefer	
Project:	None	**Temperature:**	21.6 °C		
Job Site:	TX02	**Humidity:**	47.8% RH		
Serial Number:	BL1934X1001	**Barometric Pres.:**	1019 mbar	**Tested by:**	Jonathan Kiefer
EUT:	AHBOA Remote Radio Head (RRH)				
Configuration:	4				
Customer:	Nokia Solutions and Networks				
Attendees:	John Rattanavong, Mitchell Hill				
EUT Power:	48VDC				
Operating Mode:	Band 71 carriers disabled, Band 13 carriers transmitting (Mid Ch 751.0MHz)				
Deviations:	None				
Comments:	See table comments for EUT orientation, modulation, bandwidth and frequency information.				

Test Specifications	**Test Method**
FCC 27.53:2019	ANSI C63.26:2015

Run #	7	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	5246.375	2.24	358.9	Horz	AV	1.2E-9	-59.1	-13.0	-46.1	EUT Vertical, LTE, QPSK, 10 MHz BW, Mid Ch
	5245.583	1.92	339.0	Vert	AV	1.2E-9	-59.1	-13.0	-46.1	EUT Vertical, LTE, QPSK, 10 MHz BW, Mid Ch
	3757.125	2.14	56.0	Horz	AV	1.2E-9	-59.3	-13.0	-46.3	EUT Vertical, LTE, QPSK, 10 MHz BW, Mid Ch
	3002.125	2.27	70.9	Vert	AV	807.5E-12	-60.9	-13.0	-47.9	EUT Vertical, LTE, QPSK, 10 MHz BW, Mid Ch
	4510.708	1.5	159.0	Vert	AV	719.6E-12	-61.4	-13.0	-48.4	EUT Vertical, LTE, QPSK, 10 MHz BW, Mid Ch
	4495.167	1.5	69.9	Horz	AV	703.3E-12	-61.5	-13.0	-48.5	EUT Vertical, LTE, QPSK, 10 MHz BW, Mid Ch
	3006.083	1.5	178.9	Horz	AV	687.3E-12	-61.6	-13.0	-48.6	EUT Vertical, LTE, QPSK, 10 MHz BW, Mid Ch
	3754.667	1.5	184.9	Vert	AV	671.6E-12	-61.7	-13.0	-48.7	EUT Vertical, LTE, QPSK, 10 MHz BW, Mid Ch
	2255.625	2.32	244.9	Vert	AV	454.1E-12	-63.4	-13.0	-50.4	EUT Vertical, LTE, QPSK, 10 MHz BW, Mid Ch
	2252.750	1.0	240.0	Horz	AV	414.1E-12	-63.8	-13.0	-50.8	EUT Vertical, LTE, QPSK, 10 MHz BW, Mid Ch
	1500.167	1.31	230.0	Vert	AV	114.1E-12	-69.4	-13.0	-56.4	EUT Vertical, LTE, QPSK, 10 MHz BW, Mid Ch

	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	1500.167	1.5	231.0	Horz	AV	88.5E-12	-70.5	-13.0	-57.5	EUT Vertical, LTE, QPSK, 10 MHz BW, Mid Ch

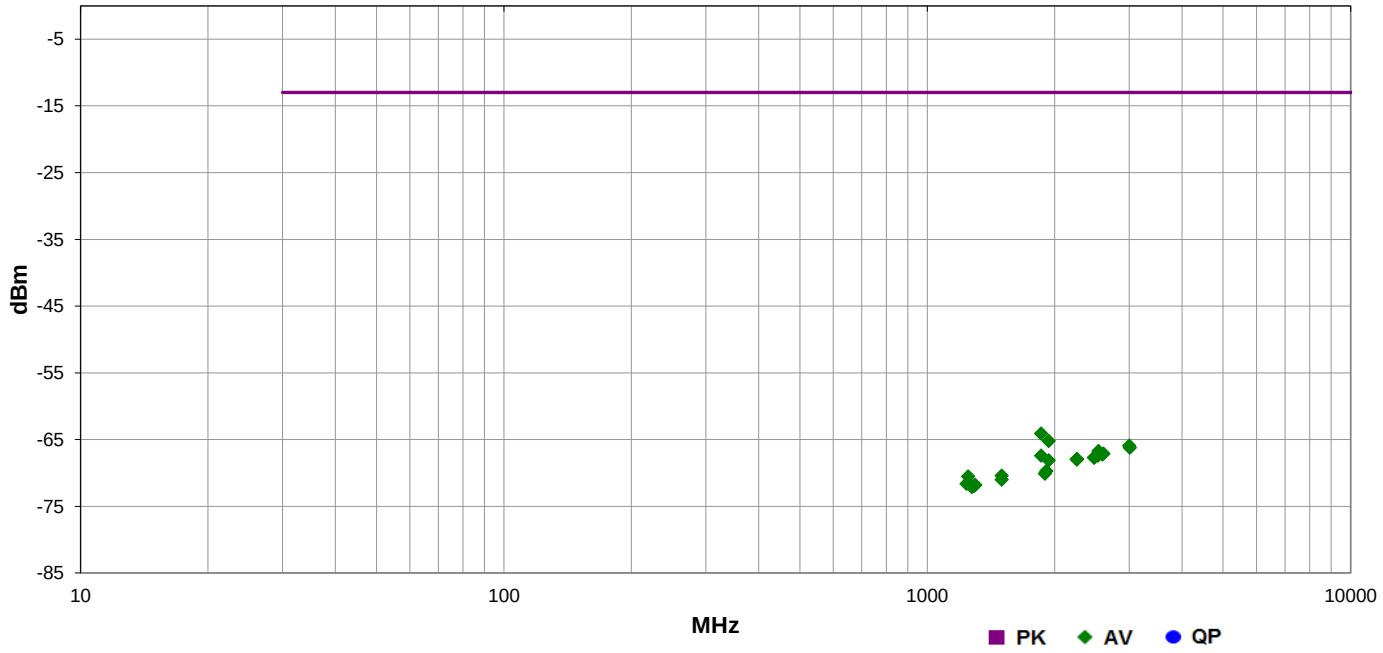
SPURIOUS RADIATED EMISSIONS

EmiR5 2019.08.15.1 PSA-ESCI 2019.05.10

Work Order:	NOKI0003	**Date:**	24-Oct-2019	Jonathan Kiefer	
Project:	None	**Temperature:**	21.6 °C		
Job Site:	TX02	**Humidity:**	47.8% RH		
Serial Number:	BL1934X1001	**Barometric Pres.:**	1019 mbar	**Tested by:**	Jonathan Kiefer
EUT:	AHBOA Remote Radio Head (RRH)				
Configuration:	4				
Customer:	Nokia Solutions and Networks				
Attendees:	John Rattanavong, Mitchell Hill				
EUT Power:	48VDC				
Operating Mode:	Band 71 carriers transmitting (Low Ch 619.5MHz, Mid Ch 634.5MHz, High Ch 649.5MHz) , Band 13 carriers transmitting (Mid Ch 751.0MHz)				
Deviations:	None				
Comments:	See table comments for EUT orientation, modulation, bandwidth and frequency information.				

Test Specifications	**Test Method**
FCC 27.53:2019	ANSI C63.26:2015

Run #	8	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**Results**	Pass



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	1858.000	2.16	274.9	Horz	AV	386.5E-12	-64.1	-13.0	-51.1	EUT Vertical, LTE, QPSK, 5 MHz BW, Low Ch (Band 71)
	1937.458	1.3	238.9	Horz	AV	300.0E-12	-65.2	-13.0	-52.2	EUT Vertical, LTE, QPSK, 5 MHz BW, High Ch (Band 71)
	2999.958	1.5	147.9	Horz	AV	255.3E-12	-65.9	-13.0	-52.9	EUT Vertical, LTE, QPSK, 10 MHz BW, Mid Ch (Band 13)
	3011.125	1.5	303.9	Vert	AV	238.3E-12	-66.2	-13.0	-53.2	EUT Vertical, LTE, QPSK, 10 MHz BW, Mid Ch (Band 13)
	2538.542	1.5	332.0	Horz	AV	212.4E-12	-66.7	-13.0	-53.7	EUT Vertical, LTE, QPSK, 5 MHz BW, Mid Ch (Band 71)
	2608.167	1.5	44.0	Vert	AV	193.7E-12	-67.1	-13.0	-54.1	EUT Vertical, LTE, QPSK, 5 MHz BW, High Ch (Band 71)
	2595.458	1.5	345.9	Horz	AV	189.3E-12	-67.2	-13.0	-54.2	EUT Vertical, LTE, QPSK, 5 MHz BW, High Ch (Band 71)
	1858.625	1.5	157.0	Vert	AV	180.8E-12	-67.4	-13.0	-54.4	EUT Vertical, LTE, QPSK, 5 MHz BW, Low Ch (Band 71)
	2531.417	1.5	261.9	Vert	AV	180.8E-12	-67.4	-13.0	-54.4	EUT Vertical, LTE, QPSK, 5 MHz BW, Mid Ch (Band 71)
	2478.917	2.56	253.0	Horz	AV	168.7E-12	-67.7	-13.0	-54.7	EUT Vertical, LTE, QPSK, 5 MHz BW, Low Ch (Band 71)
	2479.208	3.91	73.0	Vert	AV	168.7E-12	-67.7	-13.0	-54.7	EUT Vertical, LTE, QPSK, 5 MHz BW, Low Ch (Band 71)
	2258.500	3.83	189.9	Vert	AV	161.1E-12	-67.9	-13.0	-54.9	EUT Vertical, LTE, QPSK, 10 MHz BW, Mid Ch (Band 13)
	2258.000	1.5	135.0	Horz	AV	157.4E-12	-68.0	-13.0	-55.0	EUT Vertical, LTE, QPSK, 10 MHz BW, Mid Ch (Band 13)
	1937.458	1.5	164.0	Vert	AV	153.9E-12	-68.1	-13.0	-55.1	EUT Vertical, LTE, QPSK, 5 MHz BW, High Ch (Band 71)
	1911.542	1.5	69.9	Vert	AV	106.4E-12	-69.7	-13.0	-56.7	EUT Vertical, LTE, QPSK, 5 MHz BW, Mid Ch (Band 71)
	1897.833	1.5	308.0	Horz	AV	97.1E-12	-70.1	-13.0	-57.1	EUT Vertical, LTE, QPSK, 5 MHz BW, Mid Ch (Band 71)

	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	1500.292	1.5	164.0	Horz	AV	90.6E-12	-70.4	-13.0	-57.4	EUT Vertical, LTE, QPSK, 10 MHz BW, Mid Ch (Band 13)
	1249.958	1.5	183.0	Vert	AV	88.5E-12	-70.5	-13.0	-57.5	EUT Vertical, LTE, QPSK, 5 MHz BW, Low Ch (Band 71)
	1500.083	1.5	14.0	Vert	AV	78.9E-12	-71.0	-13.0	-58.0	EUT Vertical, LTE, QPSK, 10 MHz BW, Mid Ch (Band 13)
	1239.083	2.18	93.0	Horz	AV	68.7E-12	-71.6	-13.0	-58.6	EUT Vertical, LTE, QPSK, 5 MHz BW, Low Ch (Band 71)
	1299.875	2.07	154.9	Horz	AV	65.6E-12	-71.8	-13.0	-58.8	EUT Vertical, LTE, QPSK, 5 MHz BW, High Ch (Band 71)
	1290.250	1.5	322.9	Vert	AV	64.1E-12	-71.9	-13.0	-58.9	EUT Vertical, LTE, QPSK, 5 MHz BW, High Ch (Band 71)
	1276.000	1.9	244.9	Vert	AV	62.7E-12	-72.0	-13.0	-59.0	EUT Vertical, LTE, QPSK, 5 MHz BW, Mid Ch (Band 71)
	1275.042	1.5	3.0	Horz	AV	61.3E-12	-72.1	-13.0	-59.1	EUT Vertical, LTE, QPSK, 5 MHz BW, Mid Ch (Band 71)

FREQUENCY STABILITY

XMit 2019.09.05

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Meter - Multimeter	Fluke	77-IV	MLT	6-Oct-17	6-Oct-20
Thermometer	Omega Engineering, Inc.	HH311	DUI	15-Feb-18	15-Feb-21
Spectrum Analyzer	Agilent	N9020A	R204	5-Aug-19	5-Aug-20

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. Measurements were made at the transmit frequency and bands as called out in the datasheet. Testing was done with a modulated carrier as specified in the datasheet.

The primary supply voltage was varied from 85 % to 115% of the nominal voltage. Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range (-30 ° to +50° C) and at 10°C intervals.

Per the requirements of FCC Part 27.54:

“The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.”

No specific limits are provided in either FCC 27.54, the product specific rule part, or FCC 2.1055, the equipment authorization procedure for testing frequency stability. While there are no limits called out, any results less than 1ppm will still allow the radio to be operating within the band.

FREQUENCY STABILITY

element

XMit 2019.09.05

EUT:	AHBOA Remote Radio Head (RRH)			**Work Order:**	NOKI0003
Serial Number:	BL1934X1001			**Date:**	29-Oct-19
Customer:	Nokia Solutions and Networks			**Temperature:**	23 °C
Attendees:	John Rattanavong, Mitchell Hill			**Humidity:**	42.3% RH
Project:	None			**Barometric Pres.:**	1018 mbar
Tested by:	Jonathan Kiefer	**Power:**	48VDC	**Job Site:**	TX03

TEST SPECIFICATIONS	Test Method
FCC 27:2019	ANSI C63.26:2015

COMMENTS

EUT transmitting on antenna port 1 in 5MHz-QPSK-LTE mode at the Band 71 center channel (634.5MHz) and at the Band 13 center channel (751.0MHz). The EUT temperature was stabilized at each temperature step (for a minimum of 30 minutes) prior to frequency accuracy measurements. EUT operated at 100% duty cycle.

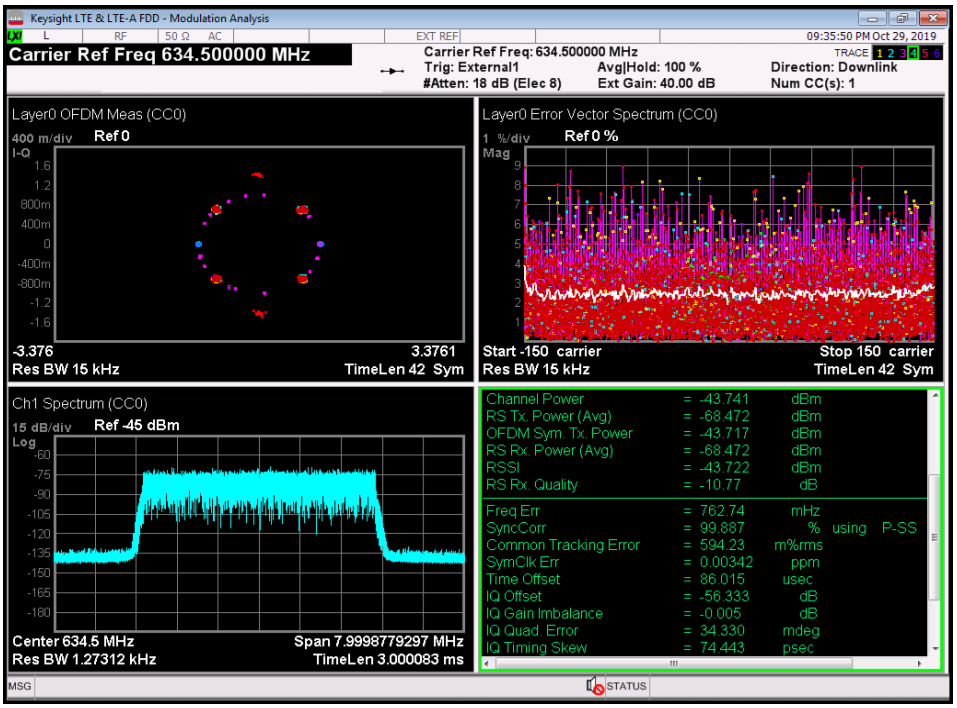
DEVIATIONS FROM TEST STANDARD

None

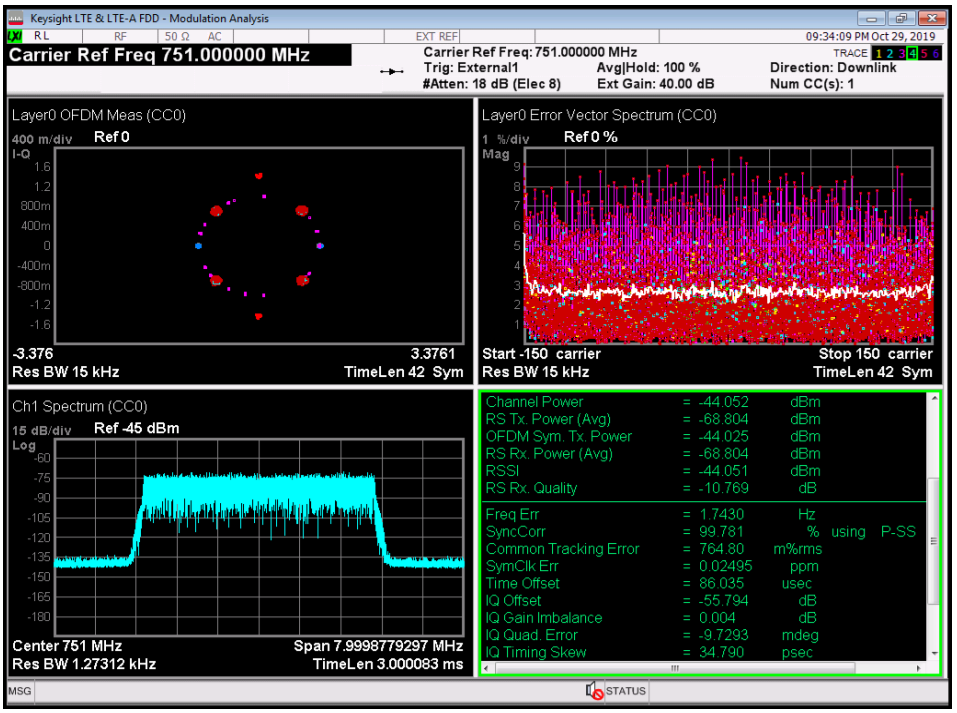
Configuration #	5	Signature	Jonathan Kiefer

	Frequency Error Value (Hz)	Frequency Error Value (ppm)	Limit (ppm)	Result
85% Nominal Voltage , 40.8 VDC				
Temperature, 20°C				
Band 71, 634.5MHz, LTE5	0.76274	0.0012	1	Pass
Band 13, 751.0MHz, LTE5	1.743	0.0023	1	Pass
Nominal Voltage, 48.0 VDC				
Temperature, -30°C				
Band 71, 634.5MHz, LTE5	0.87481	0.0014	1	Pass
Band 13, 751.0MHz, LTE5	1.0773	0.0014	1	Pass
Temperature, -20°C				
Band 71, 634.5MHz, LTE5	0.82652	0.0013	1	Pass
Band 13, 751.0MHz, LTE5	1.1677	0.0016	1	Pass
Temperature, -10°C				
Band 71, 634.5MHz, LTE5	0.74538	0.0012	1	Pass
Band 13, 751.0MHz, LTE5	1.078	0.0014	1	Pass
Temperature, 0°C				
Band 71, 634.5MHz, LTE5	0.74735	0.0012	1	Pass
Band 13, 751.0MHz, LTE5	0.99703	0.0013	1	Pass
Temperature, 10°C				
Band 71, 634.5MHz, LTE5	0.72879	0.0011	1	Pass
Band 13, 751.0MHz, LTE5	0.9707	0.0013	1	Pass
Temperature, 20°C				
Band 71, 634.5MHz, LTE5	0.90777	0.0014	1	Pass
Band 13, 751.0MHz, LTE5	0.97424	0.0013	1	Pass
Temperature, 30°C				
Band 71, 634.5MHz, LTE5	0.93524	0.0015	1	Pass
Band 13, 751.0MHz, LTE5	1.371	0.0018	1	Pass
Temperature, 40°C				
Band 71, 634.5MHz, LTE5	1.004	0.0016	1	Pass
Band 13, 751.0MHz, LTE5	0.95958	0.0013	1	Pass
Temperature, 50°C				
Band 71, 634.5MHz, LTE5	0.96991	0.0015	1	Pass
Band 13, 751.0MHz, LTE5	1.0995	0.0015	1	Pass
115% Nominal Voltage, 55.2 VDC				
Temperature, 20°C				
Band 71, 634.5MHz, LTE5	0.86449	0.0013	1	Pass
Band 13, 751.0MHz, LTE5	0.83975	0.0011	1	Pass

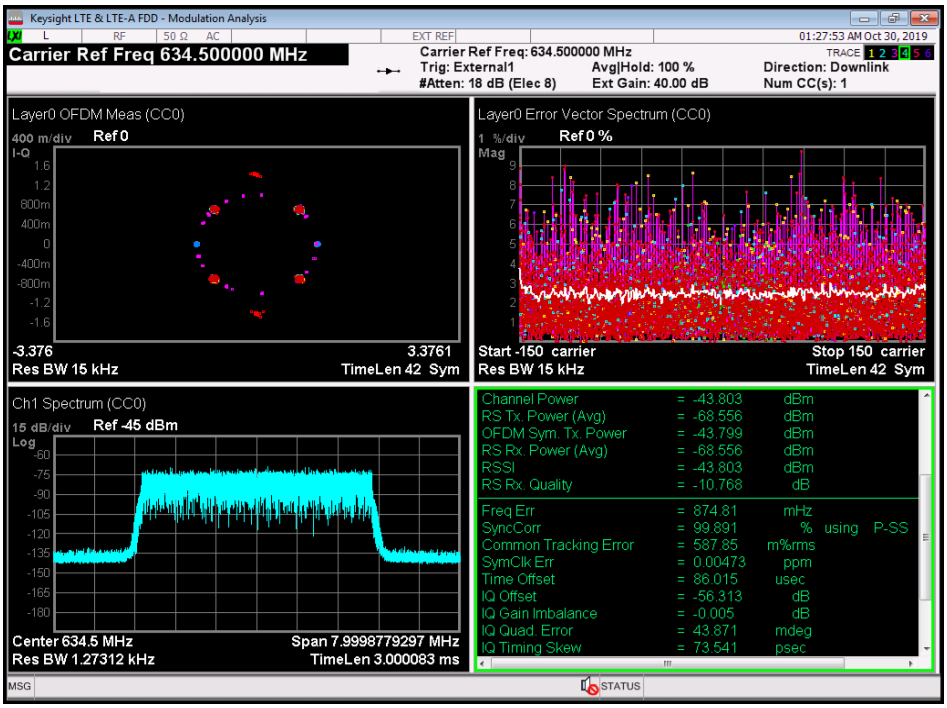
85% Nominal Voltage , 40.8 VDC, Temperature, 20°C, Band 71, 634.5MHz, LTE5						
			Frequency Error Value (Hz)	Frequency Error Value (ppm)	Limit (ppm)	Result
			0.76274	0.0012	1	Pass



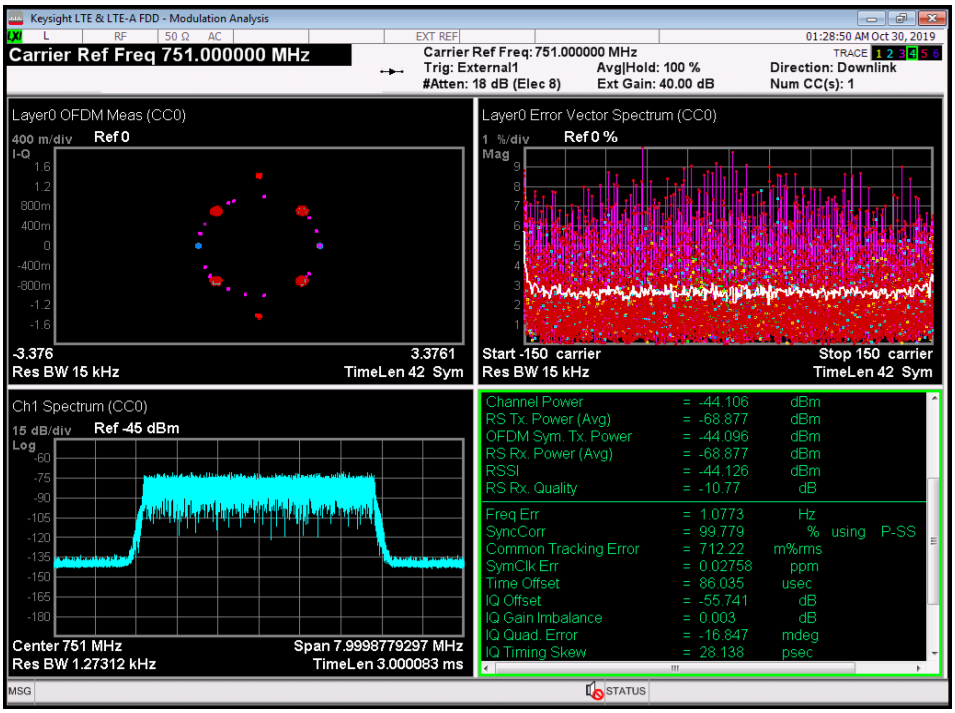
85% Nominal Voltage , 40.8 VDC, Temperature, 20°C, Band 13, 751.0MHz, LTE5						
			Frequency Error Value (Hz)	Frequency Error Value (ppm)	Limit (ppm)	Result
			1.743	0.0023	1	Pass



Nominal Voltage, 48.0 VDC, Temperature, -30°C, Band 71, 634.5MHz, LTE5						
			Frequency Error Value (Hz)	Frequency Error Value (ppm)	Limit (ppm)	Result
			0.87481	0.0014	1	Pass



Nominal Voltage, 48.0 VDC, Temperature, -30°C, Band 13, 751.0MHz, LTE5						
			Frequency Error Value (Hz)	Frequency Error Value (ppm)	Limit (ppm)	Result
			1.0773	0.0014	1	Pass

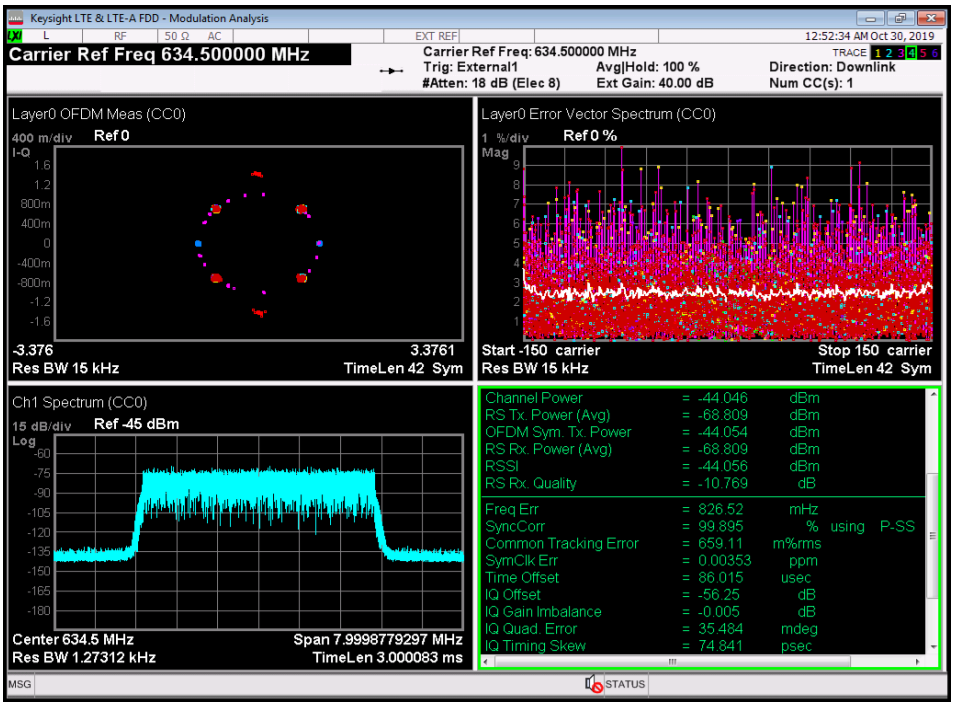


FREQUENCY STABILITY

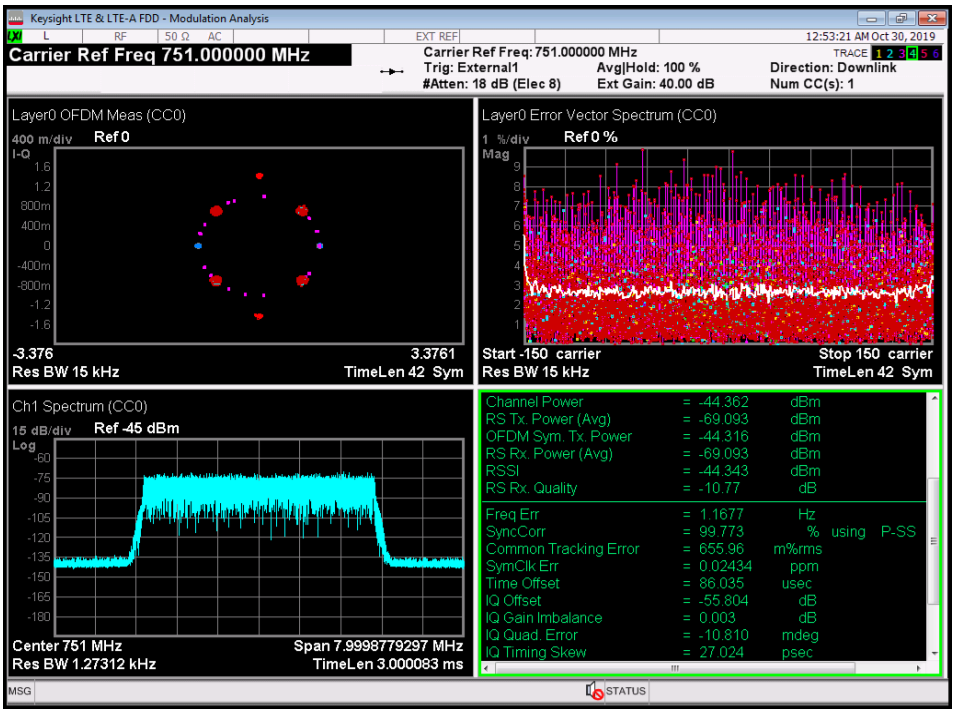
element

XMit 2019.09.05

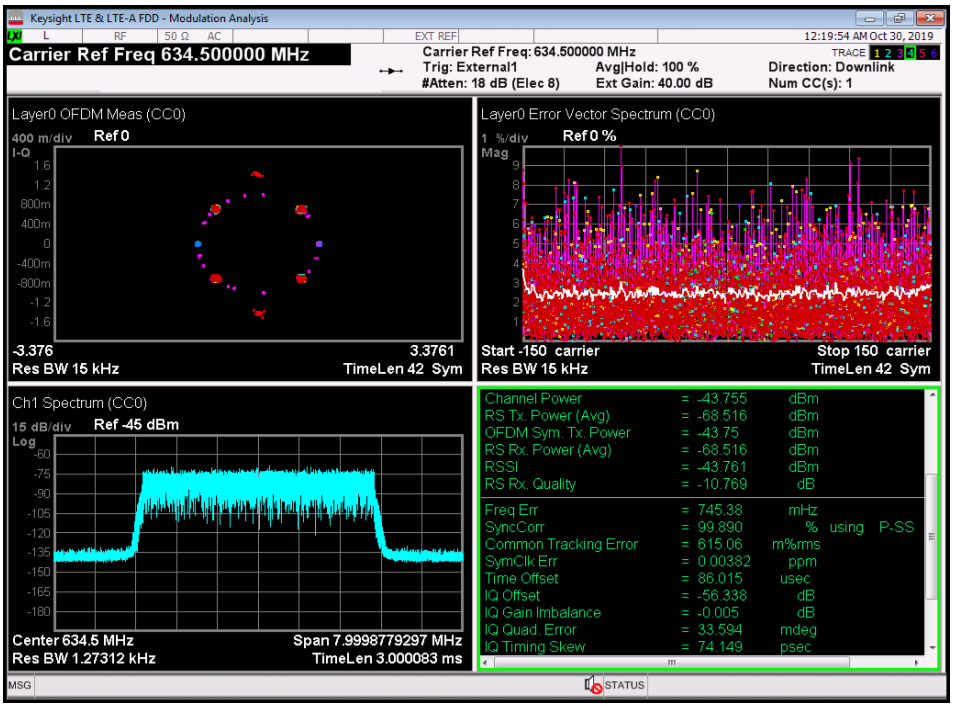
Nominal Voltage, 48.0 VDC, Temperature, -20°C, Band 71, 634.5MHz, LTE5						
			Frequency Error Value (Hz)	Frequency Error Value (ppm)	Limit (ppm)	Result
			0.82652	0.0013	1	Pass



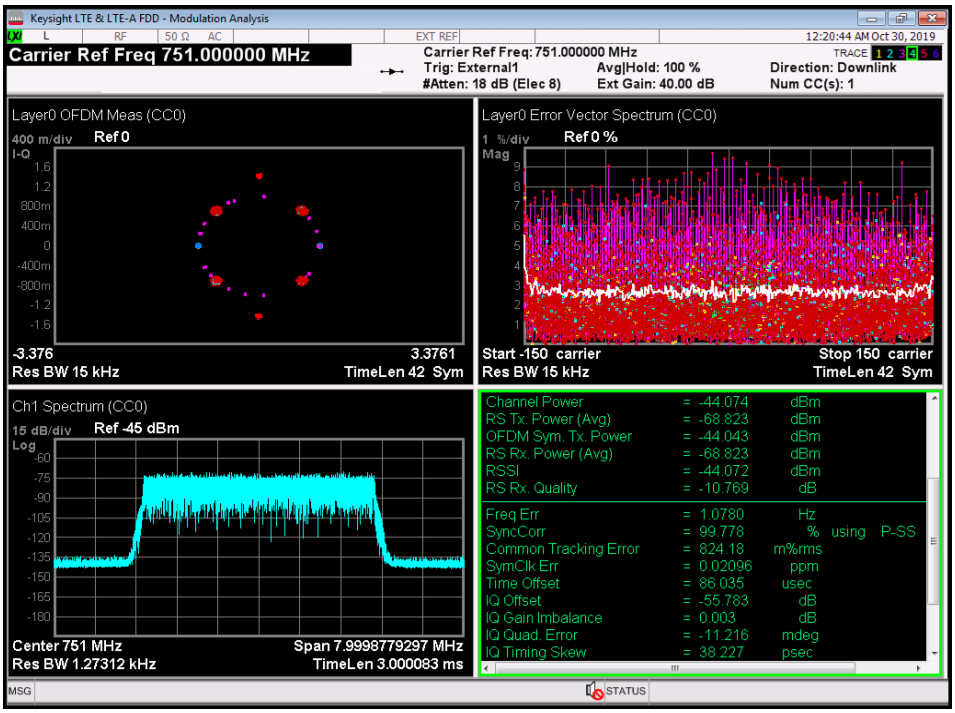
Nominal Voltage, 48.0 VDC, Temperature, -20°C, Band 13, 751.0MHz, LTE5						
			Frequency Error Value (Hz)	Frequency Error Value (ppm)	Limit (ppm)	Result
			1.1677	0.0016	1	Pass



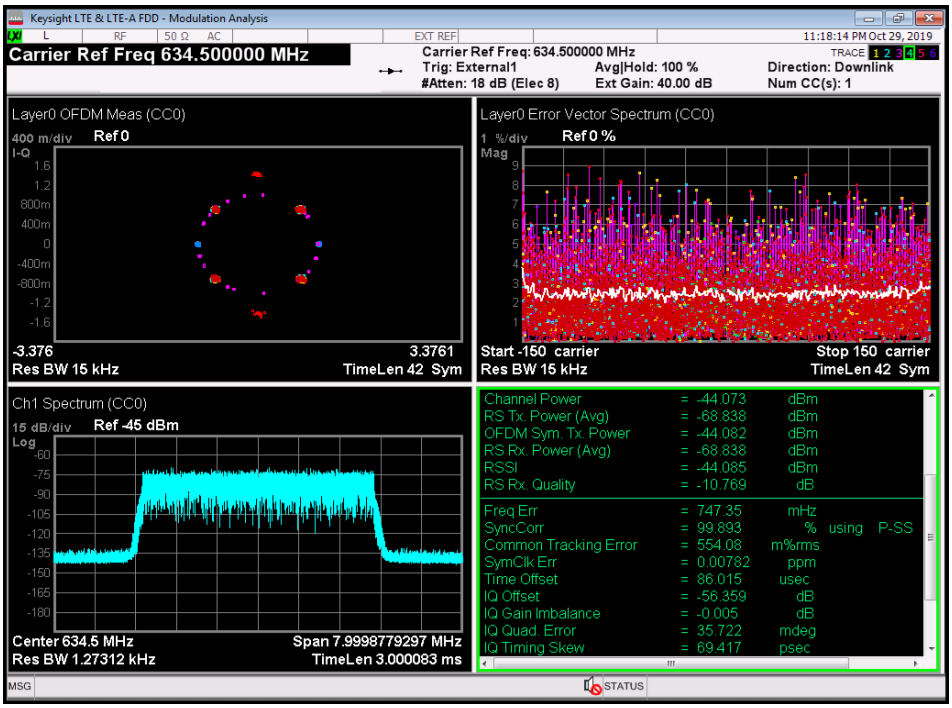
Nominal Voltage, 48.0 VDC, Temperature, -10°C, Band 71, 634.5MHz, LTE5						
			Frequency Error Value (Hz)	Frequency Error Value (ppm)	Limit (ppm)	Result
			0.74538	0.0012	1	Pass



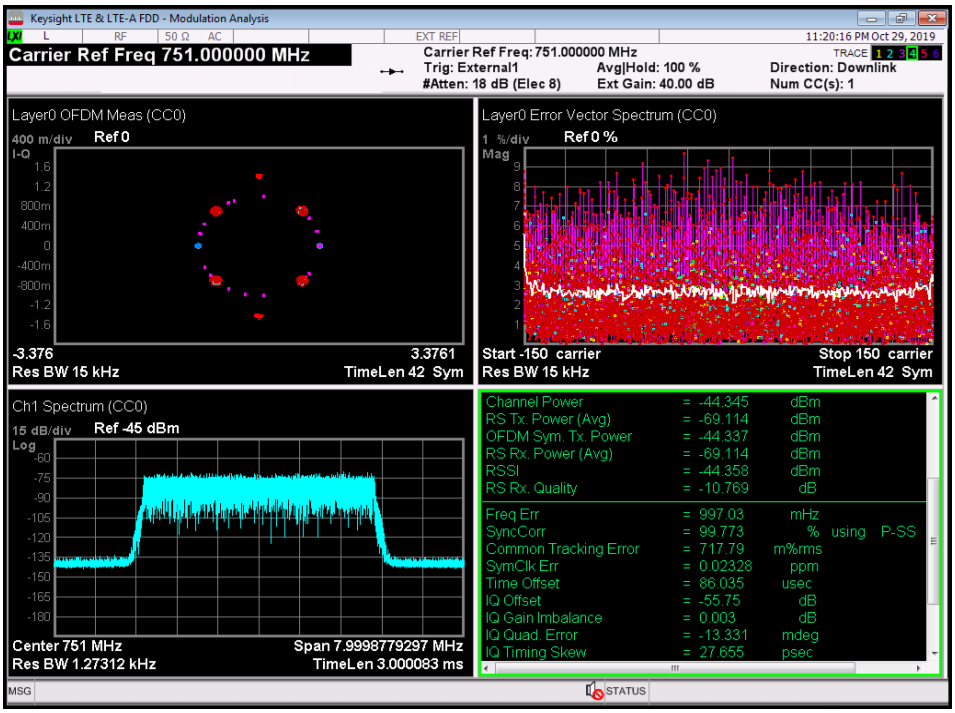
Nominal Voltage, 48.0 VDC, Temperature, -10°C, Band 13, 751.0MHz, LTE5						
			Frequency Error Value (Hz)	Frequency Error Value (ppm)	Limit (ppm)	Result
			1.078	0.0014	1	Pass



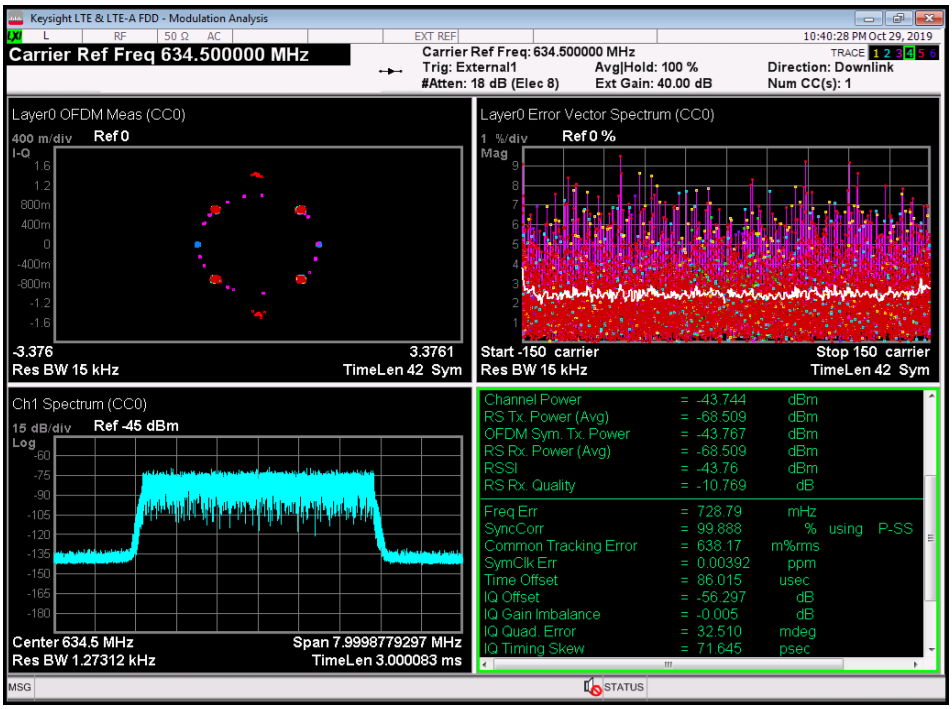
Nominal Voltage, 48.0 VDC, Temperature, 0°C, Band 71, 634.5MHz, LTE5						
			Frequency Error Value (Hz)	Frequency Error Value (ppm)	Limit (ppm)	Result
			0.74735	0.0012	1	Pass



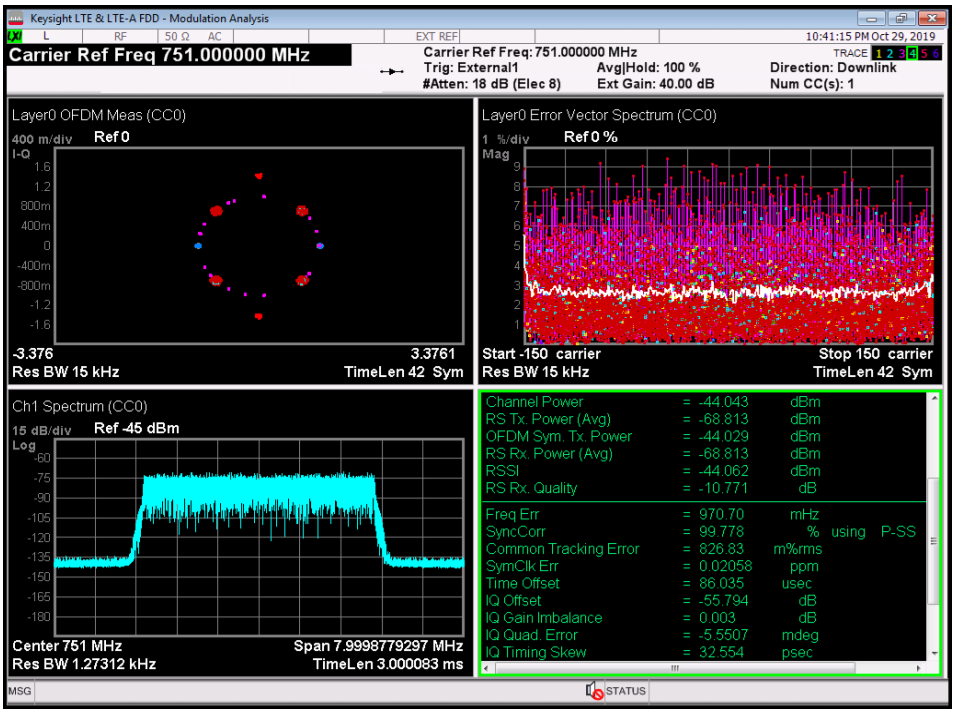
Nominal Voltage, 48.0 VDC, Temperature, 0°C, Band 13, 751.0MHz, LTE5						
			Frequency Error Value (Hz)	Frequency Error Value (ppm)	Limit (ppm)	Result
			0.99703	0.0013	1	Pass



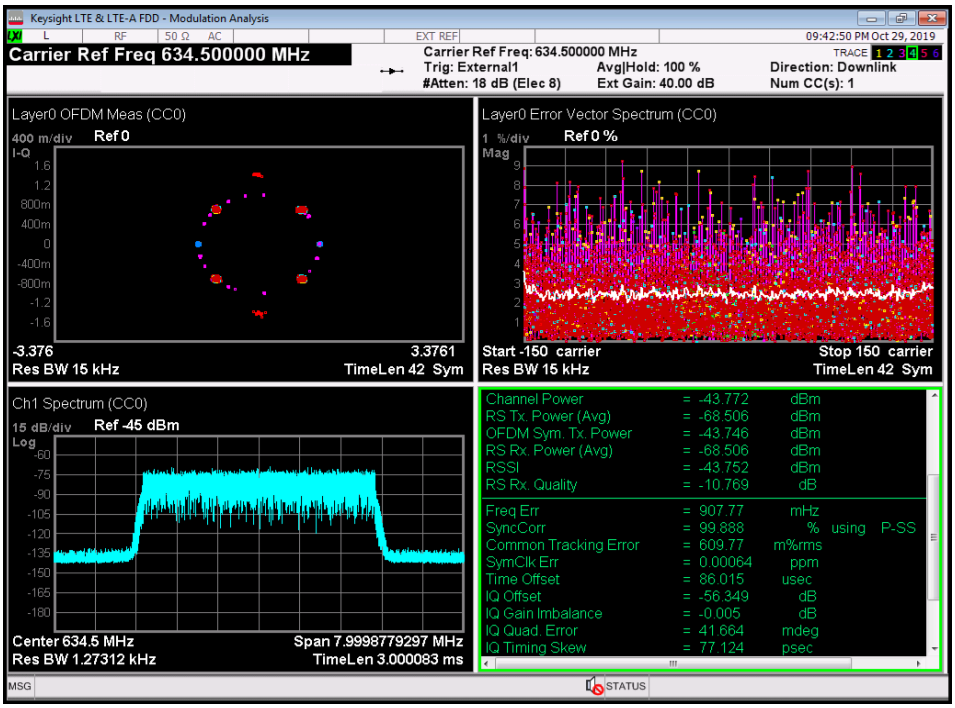
Nominal Voltage, 48.0 VDC, Temperature, 10°C, Band 71, 634.5MHz, LTE5						
			Frequency Error Value (Hz)	Frequency Error Value (ppm)	Limit (ppm)	Result
			0.72879	0.0011	1	Pass



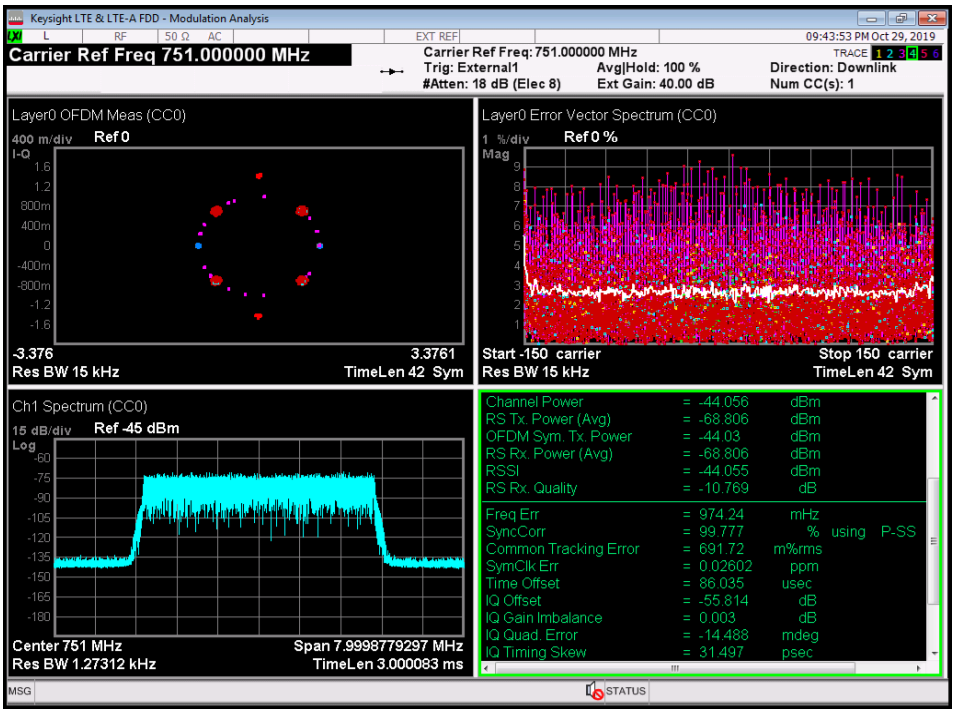
Nominal Voltage, 48.0 VDC, Temperature, 10°C, Band 13, 751.0MHz, LTE5						
			Frequency Error Value (Hz)	Frequency Error Value (ppm)	Limit (ppm)	Result
			0.9707	0.0013	1	Pass



Nominal Voltage, 48.0 VDC, Temperature, 20°C, Band 71, 634.5MHz, LTE5						
			Frequency Error Value (Hz)	Frequency Error Value (ppm)	Limit (ppm)	Result
			0.90777	0.0014	1	Pass



Nominal Voltage, 48.0 VDC, Temperature, 20°C, Band 13, 751.0MHz, LTE5						
			Frequency Error Value (Hz)	Frequency Error Value (ppm)	Limit (ppm)	Result
			0.97424	0.0013	1	Pass

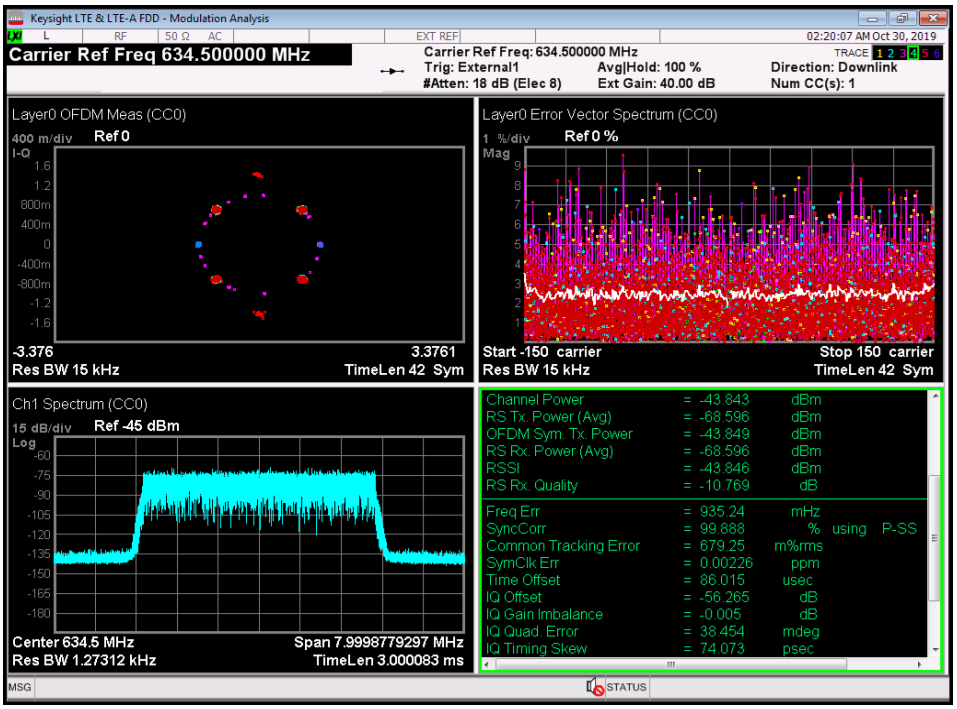


FREQUENCY STABILITY

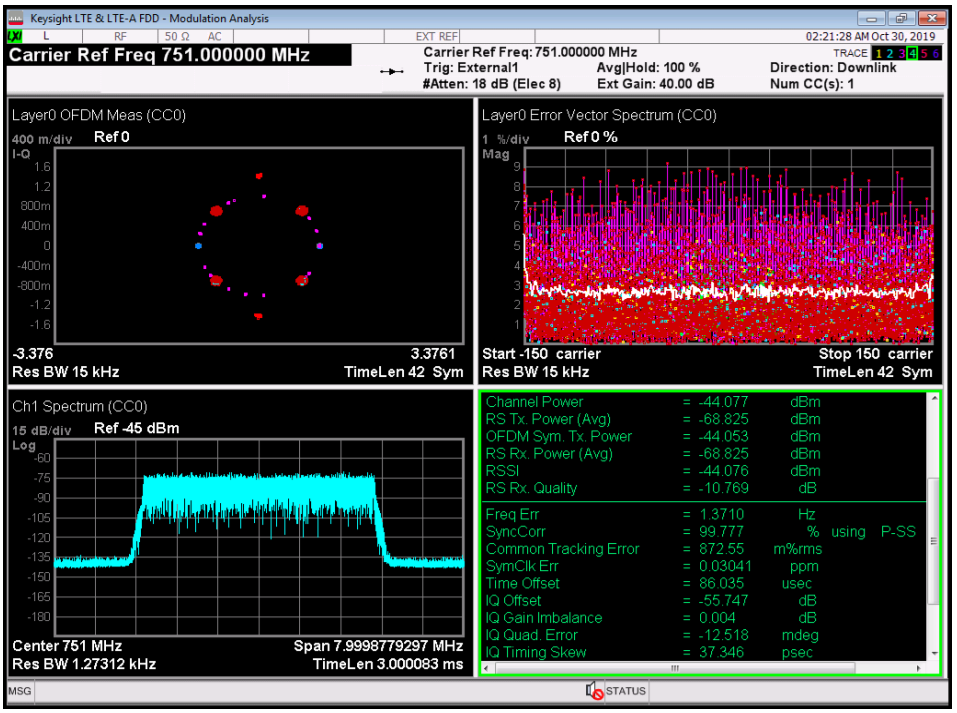
element

XMit 2019.09.05

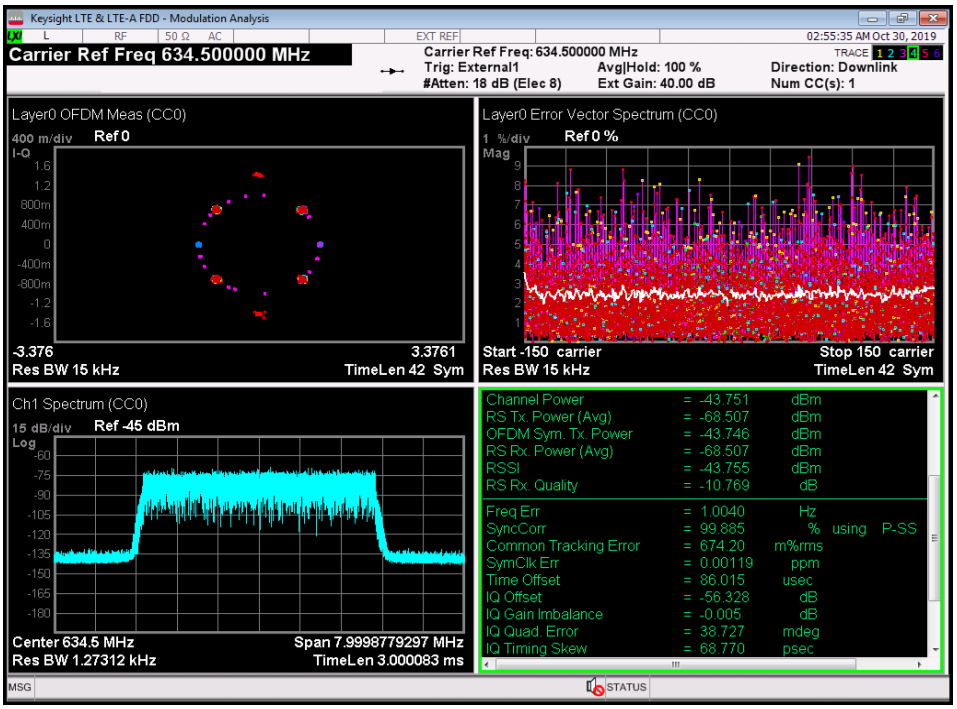
Nominal Voltage, 48.0 VDC, Temperature, 30°C, Band 71, 634.5MHz, LTE5						
			Frequency Error Value (Hz)	Frequency Error Value (ppm)	Limit (ppm)	Result
			0.93524	0.0015	1	Pass



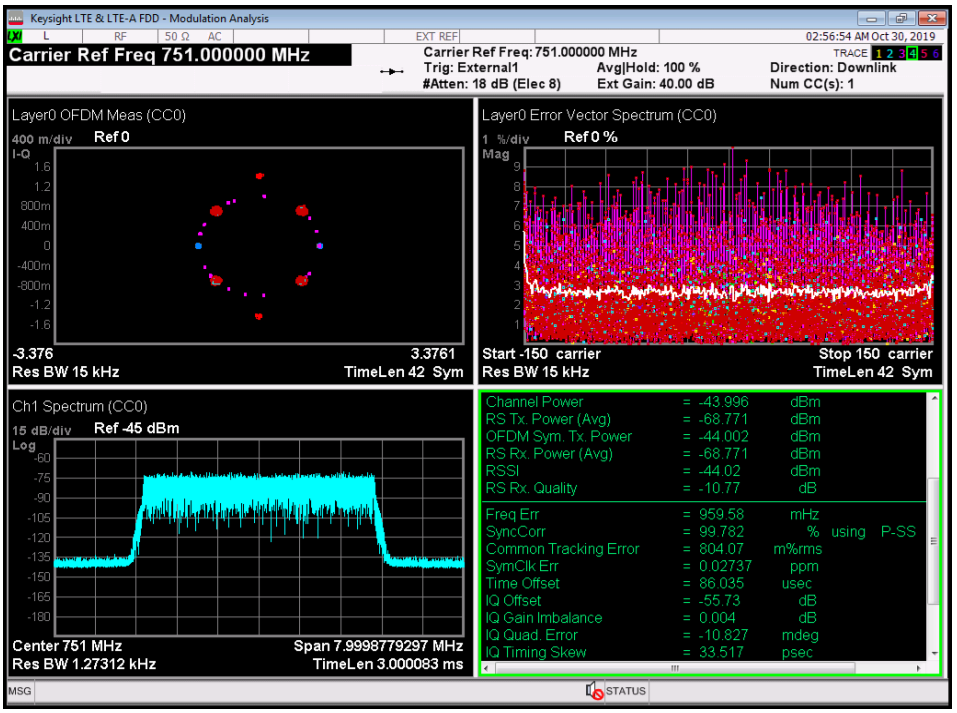
Nominal Voltage, 48.0 VDC, Temperature, 30°C, Band 13, 751.0MHz, LTE5						
			Frequency Error Value (Hz)	Frequency Error Value (ppm)	Limit (ppm)	Result
			1.371	0.0018	1	Pass



Nominal Voltage, 48.0 VDC, Temperature, 40°C, Band 71, 634.5MHz, LTE5						
			Frequency Error Value (Hz)	Frequency Error Value (ppm)	Limit (ppm)	Result
			1.004	0.0016	1	Pass



Nominal Voltage, 48.0 VDC, Temperature, 40°C, Band 13, 751.0MHz, LTE5						
			Frequency Error Value (Hz)	Frequency Error Value (ppm)	Limit (ppm)	Result
			0.95958	0.0013	1	Pass

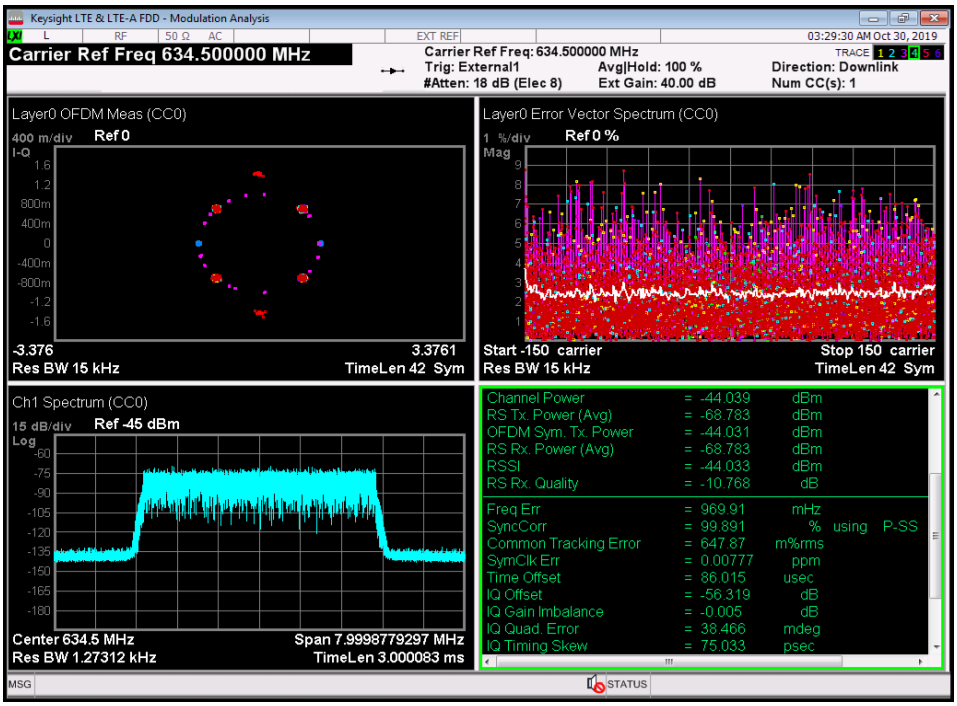


FREQUENCY STABILITY

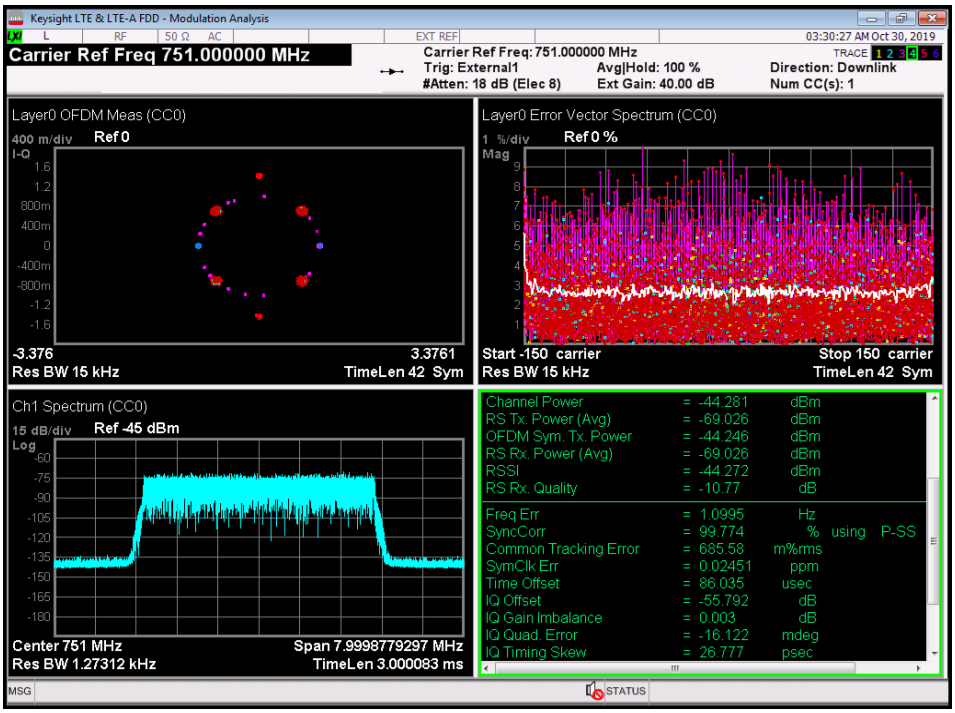
element

XMit 2019.09.05

Nominal Voltage, 48.0 VDC, Temperature, 50°C, Band 71, 634.5MHz, LTE5						
			Frequency Error Value (Hz)	Frequency Error Value (ppm)	Limit (ppm)	Result
			0.96991	0.0015	1	Pass



Nominal Voltage, 48.0 VDC, Temperature, 50°C, Band 13, 751.0MHz, LTE5						
			Frequency Error Value (Hz)	Frequency Error Value (ppm)	Limit (ppm)	Result
			1.0995	0.0015	1	Pass

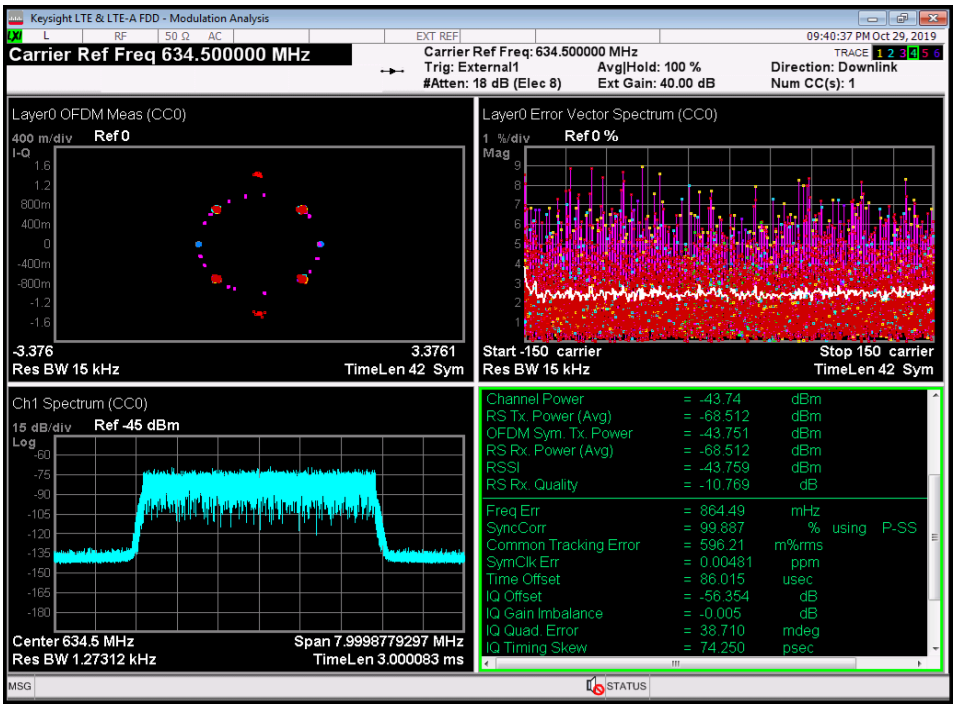


FREQUENCY STABILITY

element

XMit 2019.09.05

115% Nominal Voltage, 55.2 VDC, Temperature, 20°C, Band 71, 634.5MHz, LTE5						
			Frequency Error Value (Hz)	Frequency Error Value (ppm)	Limit (ppm)	Result
			0.86449	0.0013	1	Pass



115% Nominal Voltage, 55.2 VDC, Temperature, 20°C, Band 13, 751.0MHz, LTE5						
			Frequency Error Value (Hz)	Frequency Error Value (ppm)	Limit (ppm)	Result
			0.83975	0.0011	1	Pass